Hurricane City

Transportation Master Plan

DRAFT REPORT
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Hurricane City

Transportation Master Plan

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* If available for this study

1. Introduction

1.1. Background

The Paiute Indians called the area Timpoweap, "Rock Canyon". It is a deep gorge where the Virgin River emerges from the Hurricane Fault. The town of Hurricane lies below the fault to the south of the river and the community of La Verkin. Hot sulphur springs boil up from the bottom and sides of the river on the fault line. About one mile below the hot springs the conjoined streams of Ash Creek and La Verkin Creek make a common confluence with the Virgin River. It is a site of great historical significance.

Dominguez and Escalante in 1776 made the first historical reference to American irrigation as they observed it at this watercourse confluence: it was a Paiute Indian farm and remains a farm to this day. There are those who say that mountain men Jedediah Smith, George C. Yount, and William Wolfskill passed this way. For certain, the Parley P. Pratt southern expedition of 1849-50 and the John Steele--J.C.L. Smith exploration of 1852 along the Markagunt Plateau and Upper Virgin River used this river junction as a landmark. It was a place that could be forded.

The river has cut deep into the volcanic walls of Timpoweap Canyon, thus making it impossible to take water directly to the table-lands above. However, the soil was fertile and there was good forage, so the pioneer residents of Toquerville and Virgin town were able to use the benchland as range for their herds. These users always dreamed that some day they could get irrigation water onto the flat surface.

Visitors driving through Hurricane today may stop long enough to see the remains of an irrigation canal, supported by walls of rock and masonry, connected in places by tunnels, winding its tortuous way along the precipitous mountainside high above the riverbed until it leaves the canyon to follow the famous Hurricane Fault and then encircle the green and productive benchland of the community.

John Steele of Toquerville and James Jepson of Virgin conceived the idea of a way to get water from the Virgin River onto the Hurricane bench. As a result of their survey, made with a spirit level, the Hurricane Canal Company was organized in Toquerville on 11 July 1893. A second survey indicated that if they went upstream seven and one-half miles above the hot springs and built a fifteen-foot high dam to divert water into a canal, they could irrigate about two thousand acres of excellent quality land. Fifty-three men signed the articles of incorporation, and the stockholders authorized contracts for building the canal.

With pick and shovel, wheelbarrows, crowbars, and hand-driven drills, the hazardous and laborious work proceeded. Most of the work on the canal had to come during the winter months--November to March--to enable the workers to support their farms and families. The ditch slowly took form; the first two diversion dams washed out but the third held. Flumes on trestlework spanned open spaces, and tunnels were hacked and blasted through solid rock. As

years raced by the work slowed, with fewer and fewer workers staying on the job. Finally, the canal company ran out of money. Things came almost to a standstill. James Jepson was sent as an emissary to Salt Lake City to petition the LDS Church to subscribe for stock in the company. President Joseph F. Smith and the Council of the Twelve agreed to invest $5,000 in the effort. This boost from the church was what the project needed, and work sped forward rapidly. Water flowed through the canal to the thirsty area for the first time on 6 August 1904, nearly eleven years after the project was initiated.

Mr. and Mrs. Thomas M. Hinton became the first residents of Hurricane when they occupied the bench in 1906. Other stockholders farmed their lands by camping during the week and going home to Virgin and Toquerville over the weekend. Hurricane gradually evolved into a town of fine orchards, vineyards, alfalfa, grain, and sugar beet fields and as a center for the southern Utah sheep industry. The original eleven families of 1906 had by 1917 increased to more than one hundred families with a population of 800. During these eleven years their homes had been lighted by kerosene lamps and their culinary water dipped from ditches into barrels. In February 1917 a fifty-year franchise was granted to the Southern Utah Power Company, and by September most of the homes were wired and ready for the power which was turned on that same month. Also, the town voted a bond, and bought two-thirds of a second-foot of water from Toquerville and began installing a piped system.

When water from the Virgin River was allocated, the St. George and Washington Canal Company received thirty second-feet, La Verkin Canal Company six, and Hurricane Canal Company nine and three-fourths second-feet of primary water right. Additional water in dry seasons was assured when the Hurricane Canal Company built a storage reservoir on the Kolob Terrace.

With the establishment of the Washington County Water Conservancy District, the bulk of the Virgin River irrigation canal has been abandoned. The district supplies irrigation water in a pipeline from the diversion dam and in return uses the surplus water to fill Quail Lake reservoir. When the water reaches town it is distributed in a closed-pipe system.

Conservation of water along with good management has allowed Hurricane to annex thousands of acres of surrounding land to attract new industrial, commercial, and residential developments. Among the major industries is the Wal-Mart Distribution Center, which services one-fourth of the western United States along with western Canada and Mexico. Hurricane is attractive to businesses because of easy access to the interstate highway system, available water and power, a climate below the snow line, and a favorable job market. Numerous small manufacturing businesses have located there, and the population is expected to double or triple in the next decade.

For years Hurricane Peach Days were enjoyed by thousands of people; the festival now has expanded to become the Washington County Fair. A new library; fine school facilities; a medical clinic with full-time doctors, dentists, pharmacists, and nurses; modern stores; a good mix of religious denominations; recreation outlets for hiking, swimming, boating, and fishing; a good airport; a relatively pollution-free environment; rich biotic, geologic, and archaeological areas; handsome farms and ranches; unsurpassed scenery--all have combined to make the valley an ideal place in which to live. Strong civic pride has resulted in the creation of an outstanding Heritage Park and Pioneer and Indian Museum. More and more "snowbirds" are coming to the area to spend the winter. Excellent restaurants and motels aid tourists on their way to the nearby national and state parks and recreation areas. And, fruit

stands along the highway, loaded with local produce, continue to remind travelers of Hurricane's historic past.

This information was provided from www.onlineutah.com, in an article written by Wesley P. Larsen

1.2. Study Need

The City of Hurricane has seen a 110% population increase within the last decade and just over 47% population increase the decade before. From 1960 to 2000, the population has increased 259%. The City of Hurricane has shown a very consistent increase in population. A well-established transportation plan is needed to provide direction for continual maintenance and improvements to Hurricane City's transportation system.

Hurricane City has an adopted a General Plan. The Hurricane City General Plan briefly describes the transportation needs of this area. With the aging infrastructure of the transportation system and the need for system improvements, a more extensive transportation plan is necessary for Hurricane City and the surrounding area.

Some of the major transportation issues around the State are as follows:

- Safety
- Railroad crossings
- Trails (bicycle, pedestrian, & OHV)
- Signals
- City interchange aesthetics
- Connectivity of roadways
- Property access
- Truck traffic
- Alternate routes
- Speed limits

Hurricane City recognizes the importance of building and maintaining safe roadways, not only for the auto traffic but also for pedestrians and bicyclists.

1.3. Study Purpose

The purpose of this study is to assist in the development of a transportation master plan for Hurricane City. This plan could be adopted by Hurricane City as a companion document to the city's General Plan. With the transportation master plan in place the city can qualify for grants from the State Quality Growth Commission.

The primary objective of the study is to establish a solid transportation master plan to guide future developments and roadway expenditures. The plan includes two major components:

- Short-range action plan
- Long-range transportation plan

Short-range improvements focus on specific projects to improve deficiencies in the existing transportation system. The long-range plan will identify those projects that require significant advance planning and funding to implement and are needed to accommodate future traffic demand within the study area.

1.4. Study Area

The study area includes Hurricane City, and land adjacent to it that is in Washington County. A general location map is shown in Figure 1-1. A more detailed map of the study area and city limits is shown in Figure 1-2. The study area was developed by Hurricane City and approved by the Hurricane City Transportation Master Plan Technical Advisory Committee.

The roadway network within the study area includes SR-9, SR-59, and SR-17. Each of these roadways provides a vital function to Hurricane City proper and also access to adjacent municipalities and to Zion National Park. These roadways along with the local road network are shown in Figure 2.

1.5. Study Process

The study, which began in October 2004, is proceeding as a cooperative effort between Hurricane City, UDOT, and local community members. It is being conducted under the guidance of Hurricane City Officials. The following individuals participated in the initial

meetings to provide input used to create this document. This group listed below will be referred to as the Technical Advisory Committee or "TAC" for this document.

Thomas Hirschi	Mayor
Danny Campbell	City Council
Mac J. Hall	Public Works Director
Drake Howell	Resource Specialist State of Utah
LaMar Jensen	Scholtzen Products
Don Leavitt	Consulting Firm
Bob Scow	Landowner
Curt Hutchings	Five County AOG
Mona Lowe	Landowner
Dean McNeil	Homeowner
Vyonne Mendenhall	Landowner
Wayne Shamo	Homeowner
Dale Jackman	Citizen
Carl Wadsworth	Citizen
Gene Sturzenegger	Consulting Firm
Don Musich	Citizen
Duane Beecher	Planning Commission
Pam Humphries	Planning Commission
Cheryl Reeve	Business Owner
Charles Reeve	Landowner
Reed Reeve	Landowner
Gary Zabriskie	Five County AOG

The study process for the Hurricane City Transportation Master Plan consist of three basic parts: (1) inventory and analyze existing conditions, (2) project future conditions, and (3) development of a transportation master plan (TMP). This process involves the participation of the TAC for guidance, review, evaluation and recommendations in developing the TMP to include development of future projects for the identified study area.

The TAC will evaluate each part of the study process. Their comments will be incorporated into the study's draft final report. The remainder of the draft final report will focus on the recommendation and implementation portion of the transportation plan program. Transportation projects that will be recommended for the short-term and long-range needs will be developed based on the TAC's recommendations and concurrence.

The study process allows for the solicitation of input from the public at two TAC workshops. This public participation element is included in the study process to ensure that any decisions made regarding this study are acceptable to the community.

The first TAC workshop will provide an inventory and analysis of existing conditions and identify needed transportation improvements. The second TAC workshop will focus on prioritizing projects, estimating costs, and discussion of the funding processes.

The TAC is expected to recommend those comments that are to be incorporated into the report and applicable to the goals of this study. The draft final report and the final report will be submitted to the City for review and comments.

Upon local review of the draft report, UDOT will prepare appropriate changes and submit the final report to the City for approval. The final report will describe the study process, findings and conclusions, and will document the analysis of the recommended transportation system projects and improvements.

Figure 1-1: Hurricane Study Area Location

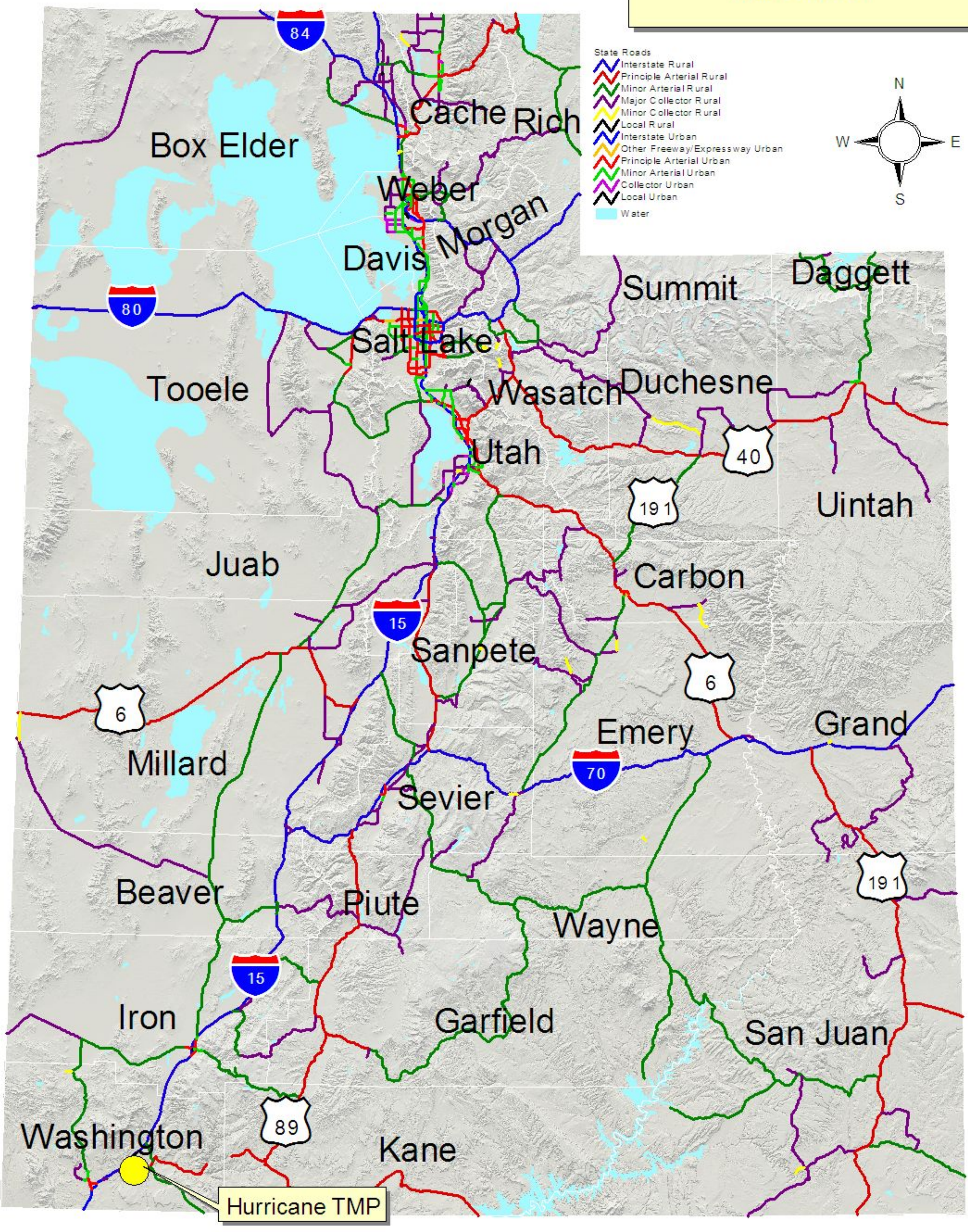
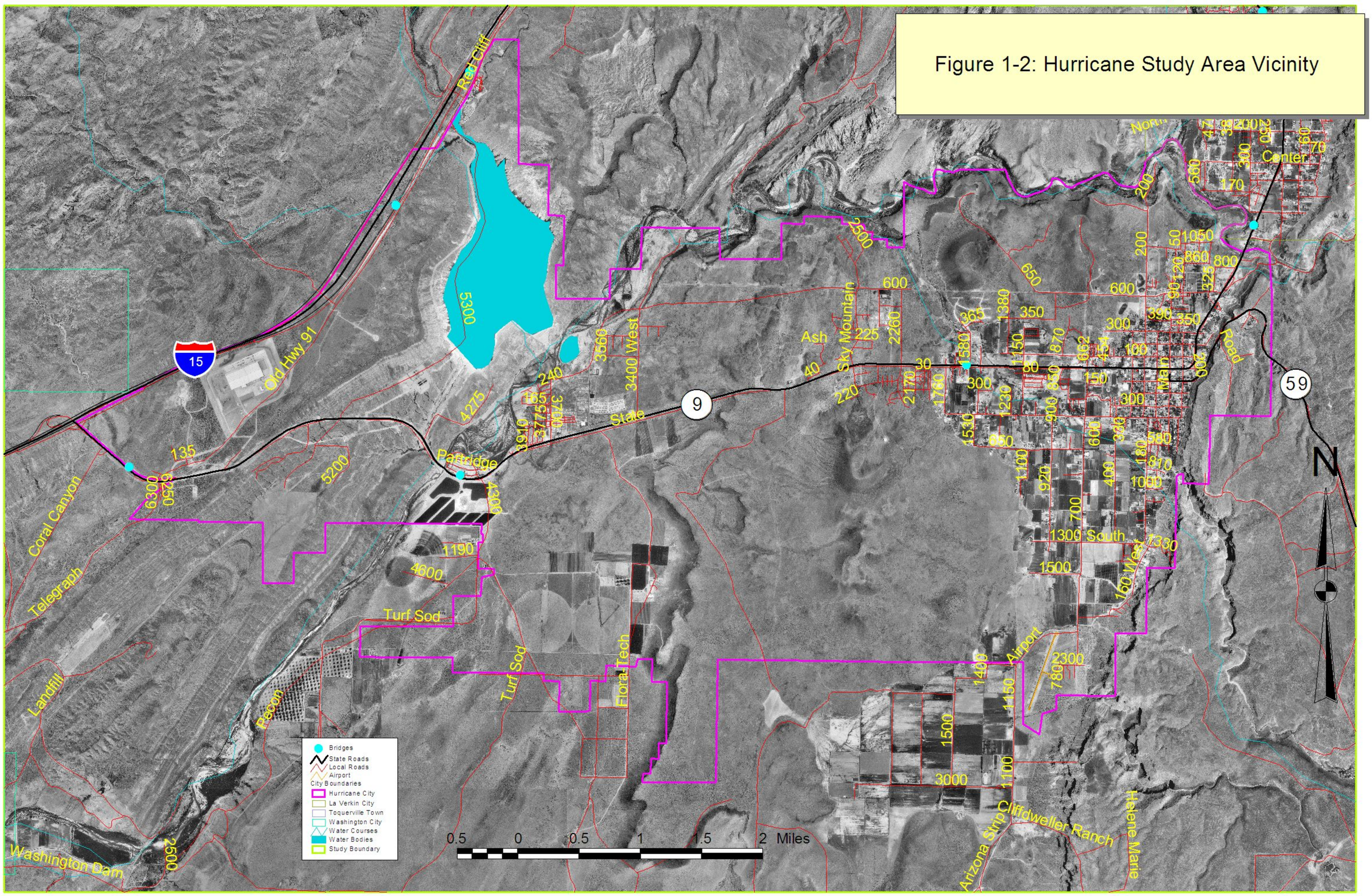


Figure 1-2: Hurricane Study Area Vicinity



2. Existing Conditions

An inventory and evaluation of existing conditions within the study area was conducted to identify existing transportation problems or issues. The results of the investigation follow.

2.1. Land Use

In order to analyze and forecast traffic volumes, it is essential to understand the land use patterns within the study area. Much of the City is zoned Residential, but there are also many issues dealing with commercial and industrial properties. By analyzing the patterns or changes in land use, we can better predict the ever-changing transportation needs.

The Hurricane City Zoning map follows on the next page.

2.2. Environmental

In Utah there are a variety of local environmental issues. Each of the cities and counties need to look at what are the environmental issues in their areas on a case-by-case basis. There are many resources that can help local entities to determine what issues need to be addressed and how any problems that may exist can be resolved.

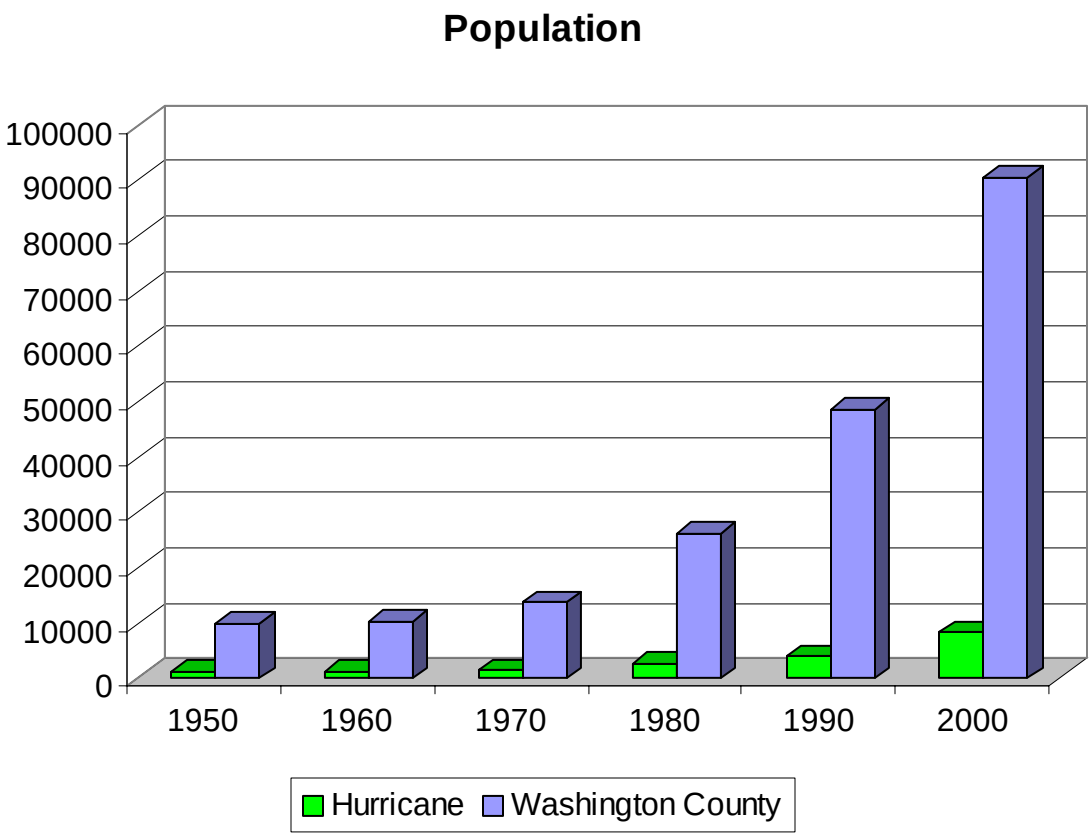
Some of the environmental concerns around the State are wetlands, endangered species, archeological sites, and geological sites among other issues. Environmental concerns should be addressed when looking at an area for any type of improvement to the transportation system. Protecting the environment is a critical part of the transportation planning process.

2.3. Socio-Economic (Census Brief: Cities and Counties of Utah, May 2001)

Hurricane City ranks 42nd for population in the State of Utah, out of 235 incorporated cities and towns. Historical growth rates have been identified for this study, because past growth is usually a good indicator of what might occur in the future. Chart 2-1 identifies the population growth over the past 50 years for the State of Utah, Washington County and Hurricane City. Chart 2-2 identifies that population change in Hurricane City has ranged from –1.57% between 1950 and 1960 to gaining 110.73% between 1990 and 2000, while growth in the State has gained between 18 and 38 percent during the past 50 years.

Chart 2-1. Population Data

Population			
Year	Utah	Washington County	Hurricane City
1950	688,862	9,836	1,271
1960	890,627	10,271	1,251
1970	1,059,273	13,669	1,408
1980	1,461,037	26,065	2,660
1990	1,722,850	48,560	3,915
2000	2,233,169	90,354	8,250



Source: U.S. Bureau of the Census
http://www.govenor.utah.gov/dea/OtherPublications.html

Chart 2-3 identifies yearly population growth rates for the State of Utah and Washington County.

As the State population has grown every decade from 1950 until 2000, Washington County has also showed a slower, yet consistent, rate of growth in population over the same period.

Hurricane City has some unique demographic characteristics when compared with the State, particularly with age demographics. In the 25 to 54-age category, the State is at 38.6% the County is at 32.0% and the City is at 31.3%. For the 65+-age category, the State is at 8.5%, the County is at 17.0% and the City is at 16.8%. The State's median age is 27.1 years and the County's median age is 31.0 years, City's median age is 31.5 years. Another interesting statistic is that of Veteran status with State at 10.7%, County at 15.1%, and Hurricane City at 15.7%.

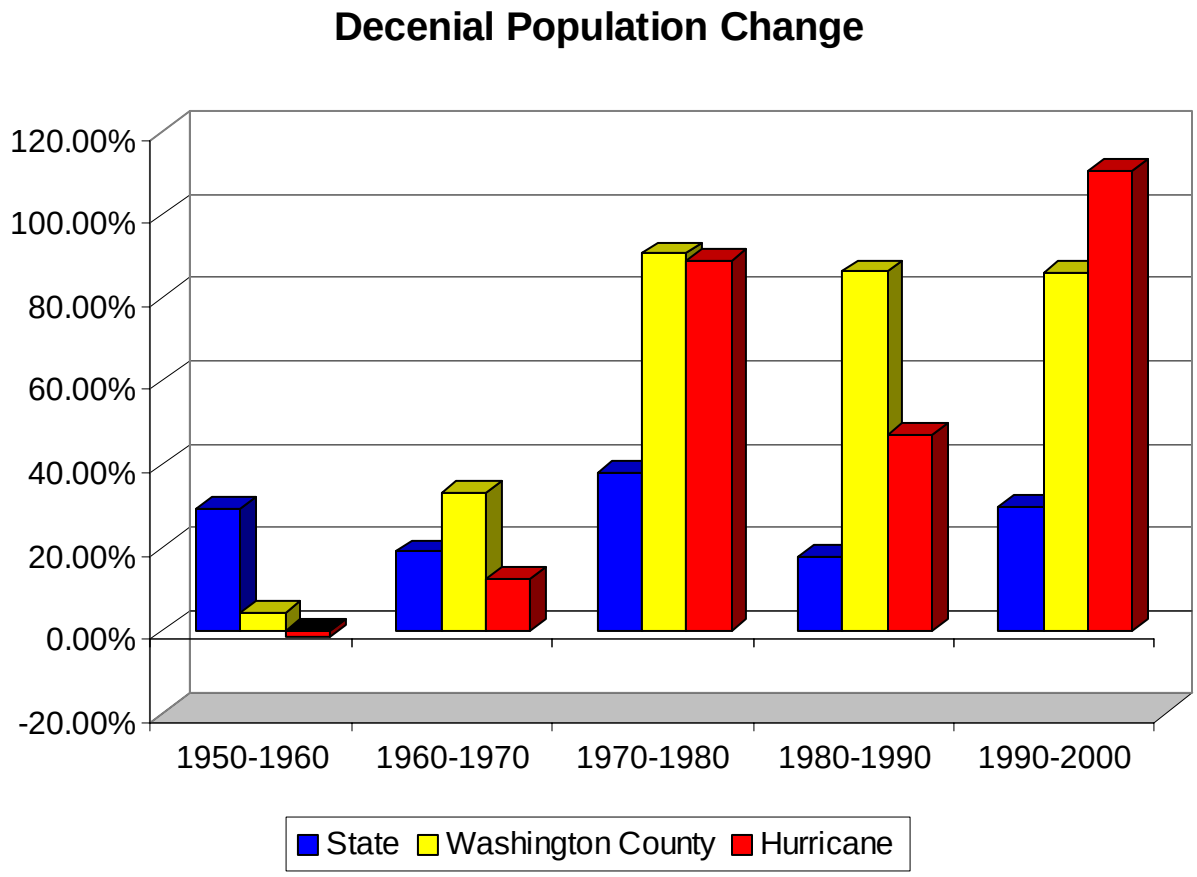
The 2000 median household income in Hurricane City is $32,865, compared to the State median household income of $45,726.

The unemployment rate in Hurricane City was 5.6 percent in 2000. According to the Utah Department of Employment Security (UDES), in 2000 there were approximately 3,183 employed people in Hurricane City or 54.8% of the population. The city has 189 unemployed people, which is 3.3 % of the population. There are 35,646 employed people in Washington County or 54.4% percent of the population. The county has 2,065 people unemployed, which is 3.2 % of the population.

The majority of employees in Washington County work in three primary employment sectors: Trade, Services and Government as shown in Chart 2-5. In the county, these sectors make up 53.61% of the labor force. Another interesting note was that housing built from 1990-2000 were 54.6% of total for Hurricane City compared to 25% for the state. Also homes built before 1939 were 5.9% of the total for Hurricane City with 10% for the state.

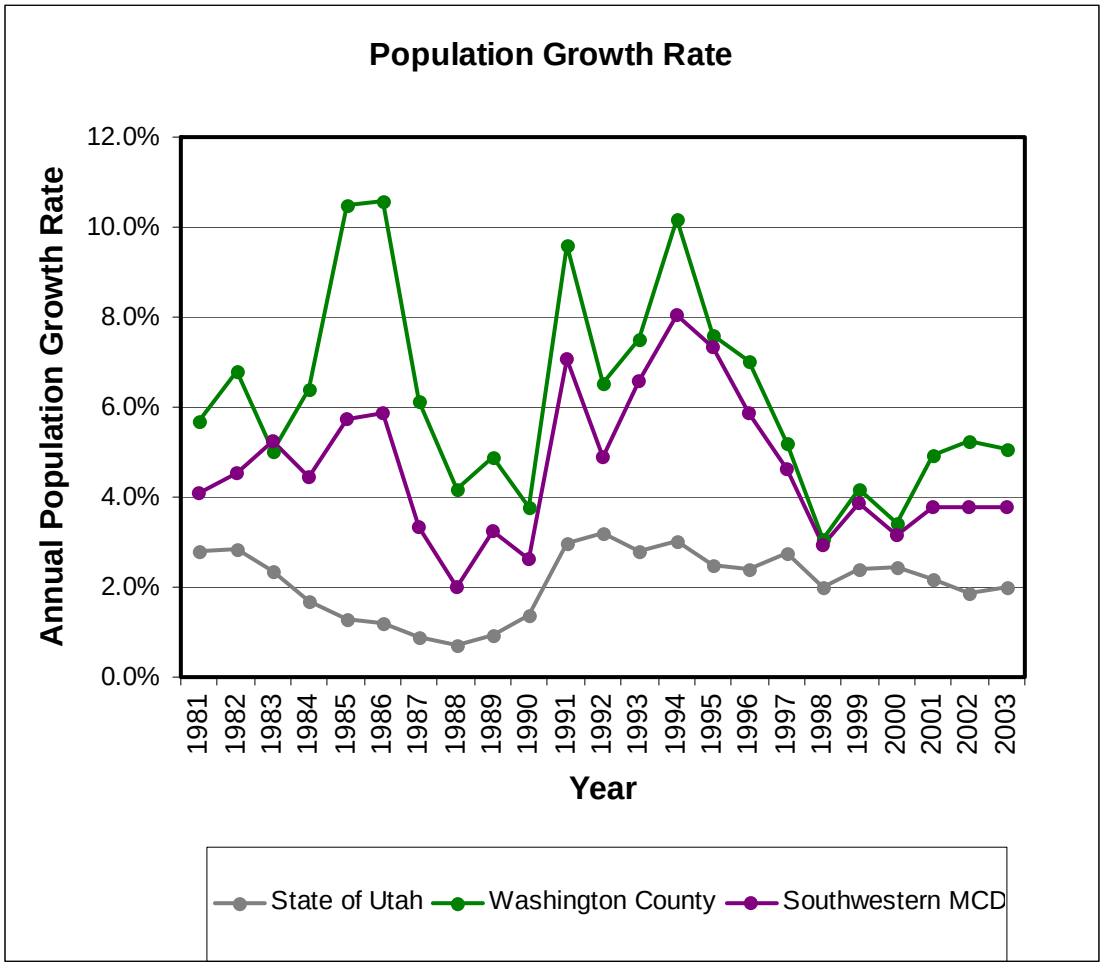
Chart 2-2. Population Change Data

Decade	State of Utah	Washington County	Hurricane City
1950-1960	29.29%	4.42%	-1.57%
1960-1970	18.94%	33.08%	12.55%
1970-1980	37.93%	90.69%	88.92%
1980-1990	17.92%	86.30%	47.18%
1990-2000	29.62%	86.07%	110.73%



Source Data: U.S. Bureau of the Census
http://www.govenor.utah./dea/OtherPublications.html

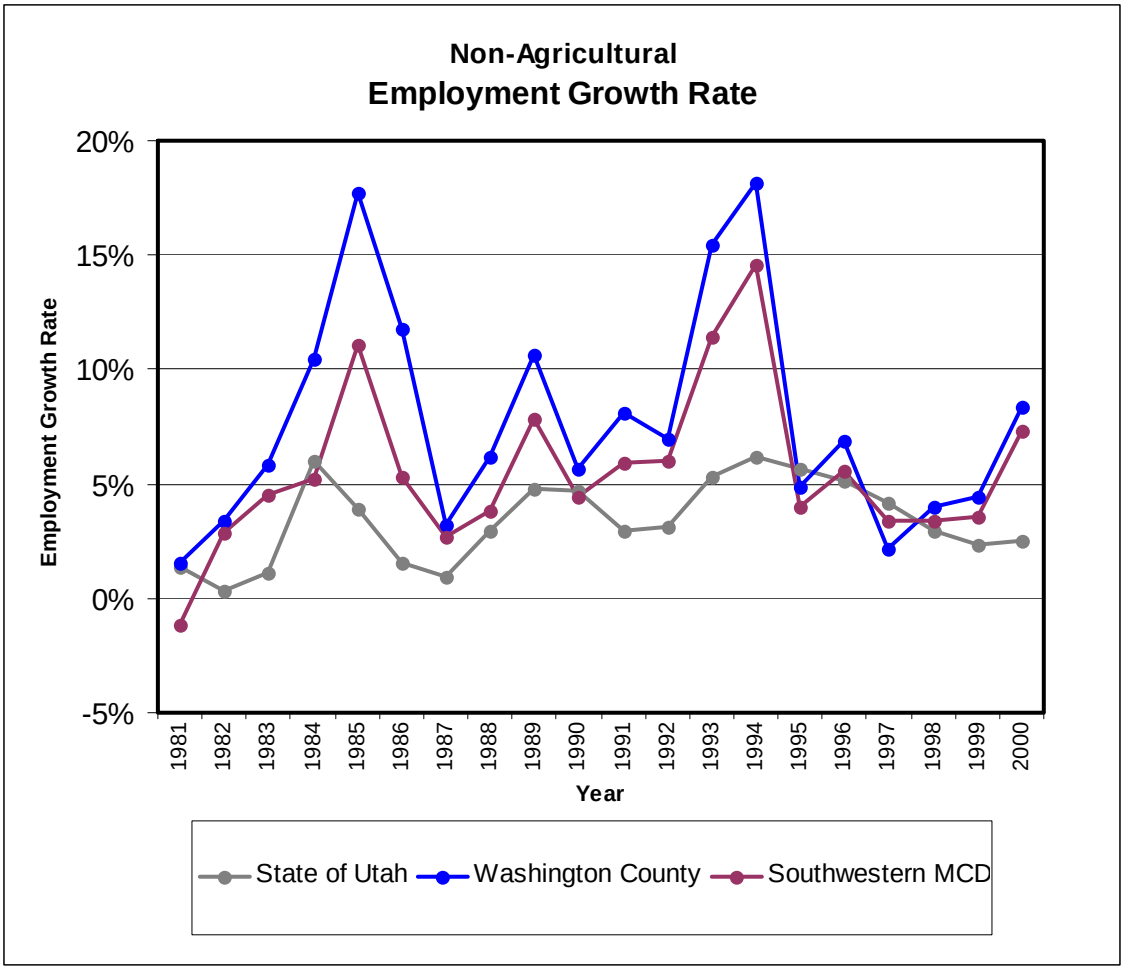
Chart 2-3. Population Growth Rate (1980-2000)



MCD = Multi-County Districts, Southwest MCD = Beaver, Garfield, Iron, Kane & Washington Counties

Source: Governors Office of Planning and Budget
http://www.governor.utah.gov/dea

Chart 2-4. Employment Growth Rate (1980-2000)



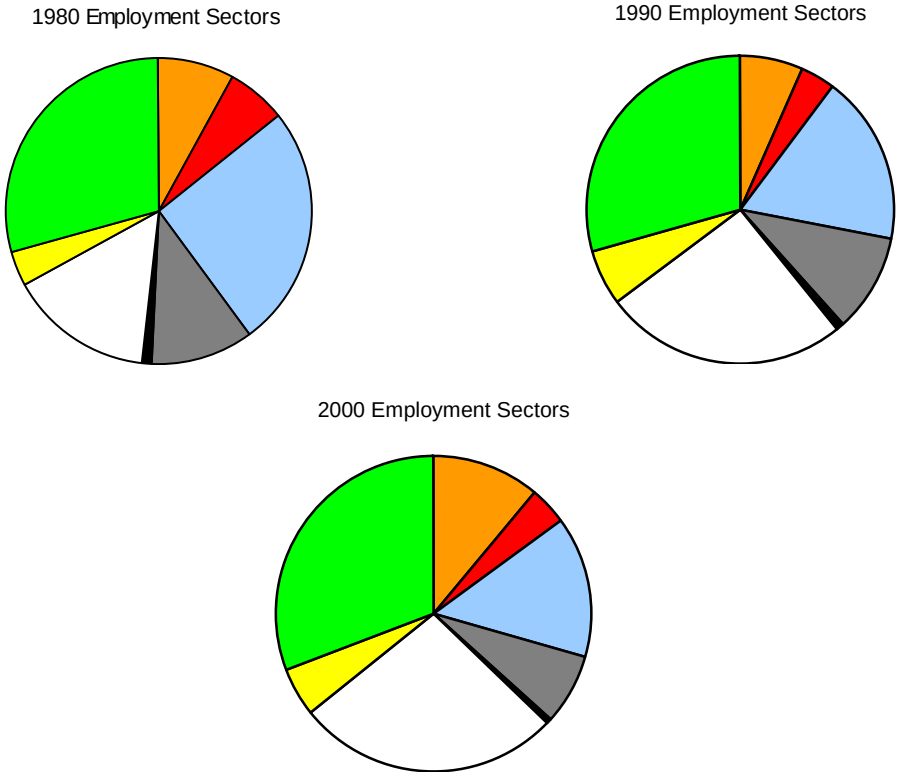
MCD = Multi-County Districts, Bear River MCD = Beaver, Garfield, Iron, Kane & Washington Counties

Source: Governors Office of Planning and Budget
http://www.governor.utah.gov/dea

Chart 2-5. Employment Sectors (1980-2000)

Sector	1980	1990	2000	Δ% 1980-2000
Construction	8.22%	6.75%	11.10%	587.71%
FIRE	6.25%	3.48%	3.91%	218.87%
Government	25.81%	18.01%	14.66%	189.21%
Manufacturing	10.68%	10.51%	7.18%	241.98%
Mining	1.07%	0.71%	0.57%	168.57%
Services	15.35%	25.81%	27.11%	799.10%
TCPU	3.54%	5.85%	4.89%	603.90%
Trade	29.63%	29.70%	30.96%	431.82%

FIRE = Finance, Insurance & Real Estate
TCPU = Telecommunications & Public Utilities



Source: Governors Office of Planning and Budget
http://www.governor.utah.gov/dea/HistoricalData.html

2.4. Functional Street Classification

This document identifies the current function and operational characteristics of the selected roadway network of Hurricane City. Functional street classification is a subjective means to identify how a roadway functions and operates when a combination of the roadway's characteristics are evaluated. These characteristics include; roadway configuration, right-of-way, traffic volume, carrying capacity, property access, speed limit, roadway spacing, and length of trips using the roadway.

The primary classifications used in classifying selected roadways of Hurricane City are: Interstate, Principle Arterial, Minor Arterial, Major Collector, Minor Collector and Local. An Arterial's function is to provide traffic mobility at higher speeds with limited property access. Traffic from the local roads is gathered by the Collector system, which provides a balance between mobility and property access trips. Local streets and roads serve property access based trips and these trips are generally shorter in length.

The Hurricane City area is accessed by SR-9 as well as by SR-59. The functionally classified system is currently being revised statewide. The current functionally classified system generally defines the higher traffic roads, so only minor additions or changes will be required.


Bridges
State Roads
Interstate Rural
Principal Arterial Rural
Minor Arterial Rural
Other FAU Roads
Major Collector Rural
Local Road Rural (SR-318)
Hurlocal.shp
hurairports.shp
hurstreams.shp
Water Bodies
Study Boundary
City Boundaries
Hurricane City
La Verkin City
Toquerville Town
Washington City
0.5 0 0.5 1 1.5 2 Miles
N
15
318
9
17
59
Red Cliff
Old Hwy 91
Coral Canyon
Telegraph
Landfill
Washington Da
Partridge
Turf Sod
Flora-Tech
Airport
Arizona Strip
Cliffdweller Ranch
Helene Marie
Sky Mountain
Ash
Shangri-la
North 560 West
Center
Main
Road
Cyndi
1300 South
160 West
3400 West

Figure 2-2: Existing State and Federal Routes Functional Classification

2.5 Bridges

There are eleven bridges on the state system located in the study area that could be eligible for federal bridge maintenance, rehabilitation, or replacement funds. Bridges are maintained and minor repairs made with maintenance funds. A bridge is rehabilitated or replaced as it deteriorates over time and as traffic volumes increase. (Figure 2-3 Bridge Sufficiency Rating)

Table 1 compares the bridges in the study area and identifies their sufficiency rating and location. Sufficiency rating indicates current condition of the structure with a rating of 100 showing a structure that is in excellent shape. A rating nearing 50 will reveal a structure that is in need of attention and is eligible for federal funding.

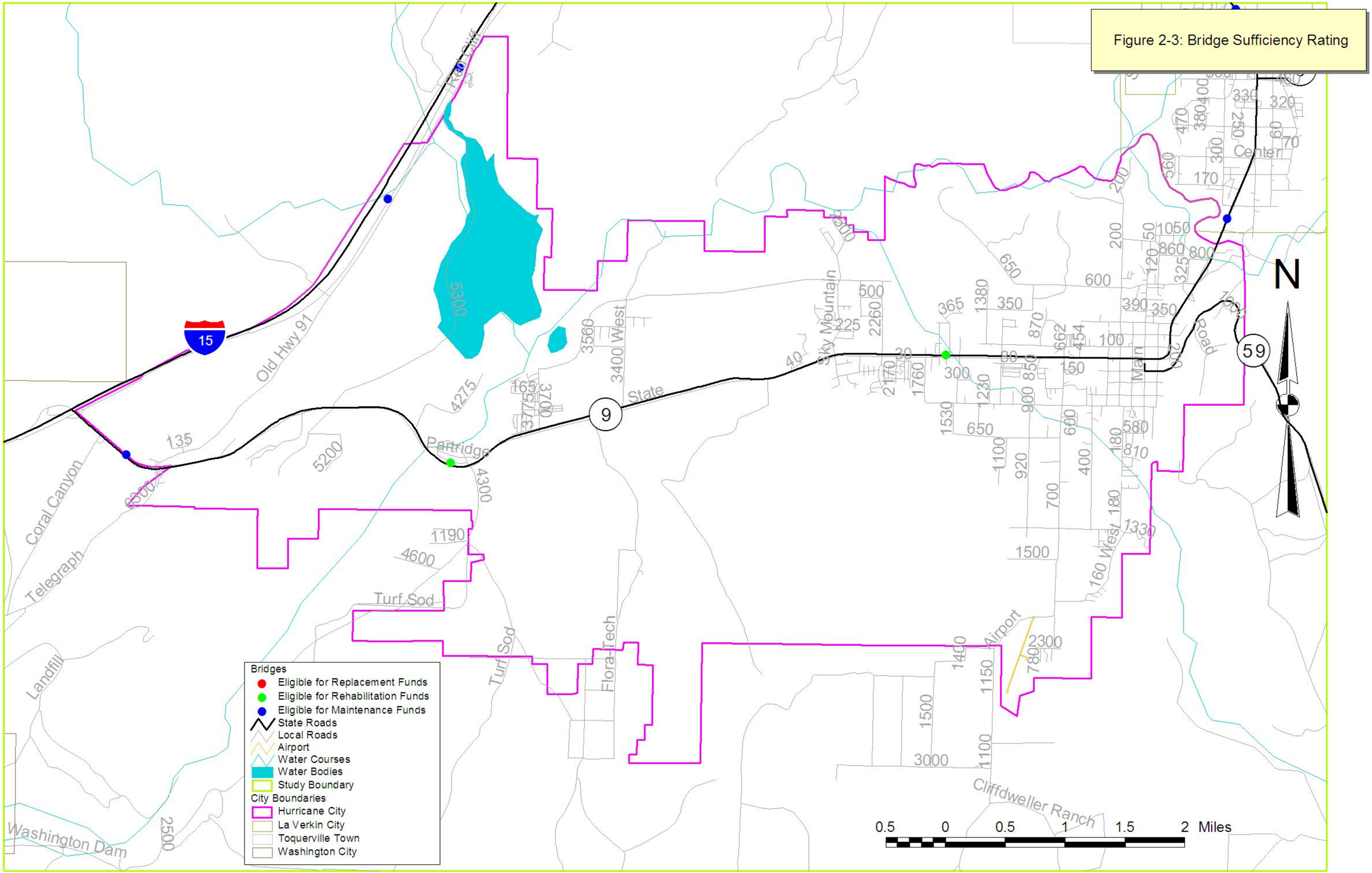
Table 1. Bridges

Number	Location	Maximum Span	No. Lanes & Road Width	Sidewalk	Sufficiency Rating
0F-672	SR-9 & Coral Canyon BLVD.	33.7m	6 Lanes, 35.2m	No	83.0
R-233	SR-9 & Quail Creek	7.0m	4 Lanes, 23.8m	No	69.9
C-777	SR-9 & Virgin River	68.0m	4 Lanes, 29.3m	Yes	85.0
E-2410	SR-9 & Gould's Wash	5.9m	4 Lanes, 23.8m	No	69.9
1C-915	SR-9 & Virgin River	98.0m	2 Lanes, 12.0m	Yes	90.4
C-158	SR-9 & Virgin River	98.0m	2 Lanes	No	Just Rehabed Arch Bridge
C-915	SR-9 & Virgin River	87.8m	2 Lanes	Yes	90.4
3E-1301	I-15 & Cottonwood Creek	5.2m	2 Lanes	No	85.6
1D-555	I-15 & Cottonwood Creek	20.4m	2 Lanes	No	94.6
1E-1081	I-15 & Harrisburg Creek NBL	5.5m	2 Lanes	No	97.6
3E-1296	I-15 & Harris burg Creek SBL	3.7m	2 Lanes	No	97.6

Bridge Sufficiency Rating – Figure 2-3

Source: Utah Department of Transportation/Structures Division

Figure 2-3: Bridge Sufficiency Rating



2.6 Traffic Counts

Recent average daily traffic count data were obtained from UDOT. Table 2 shows the traffic count data on the key roadways of the study area. The number of vehicles in both directions that pass over a given segment of roadway in a 24-hour period is referred to as the average annual daily traffic (AADT) for that segment.

Table 2. Average Annual Daily Traffic

Road	Segment	Year	AADT
SR-6	West Incorporated Limits Hurricane	2002	16,000
SR-6	Junction SR-59 in Hurricane	2002	17,000
SR-6	East Incorporated Limits Hurricane	2002	16,000
I-15	Hurricane Interchange SR-9	2002	18,000
SR-17	Anderson Junction	2002	2,100
SR-59	East Incorporated Limits Hurricane	2002	2,800

Source: Utah Department of Transportation

**INCL=Incorporated City Limits*

These are averages for the entire year. Hurricane City experiences a significant increase in traffic during the summer months. UDOT maintains 86 continuously operated automatic traffic recorders (ATR) throughout the state highway system. ATRs collect data continuously throughout the year in order to determine monthly, weekly, daily, and hourly traffic patterns. One ATR located in or near the study area on SR-9. The following points summarize the 2003 data from the ATR at this location.

Traffic on SR-9; 1.3 miles west of SR-318, Hurricane; @ MP 1.11

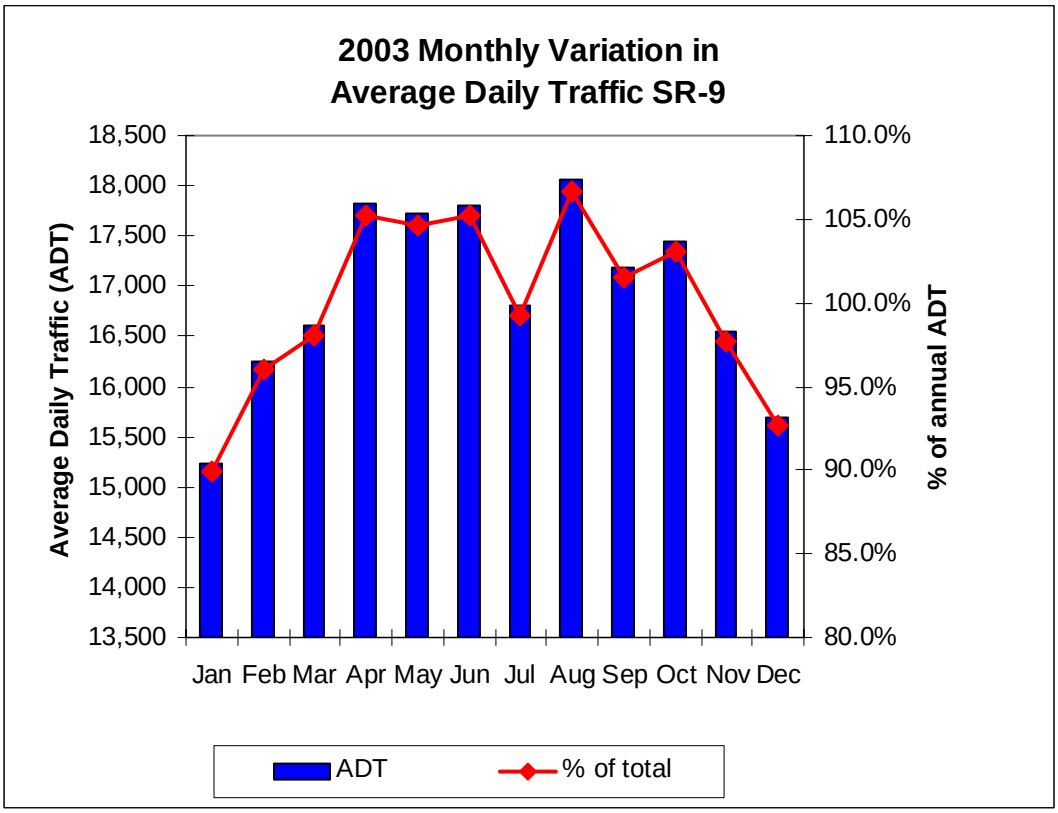
- August was the highest volume month.
- January was the lowest volume month.
- The highest daily volumes occurred on Friday.
- The lowest daily volumes occurred on Sunday.

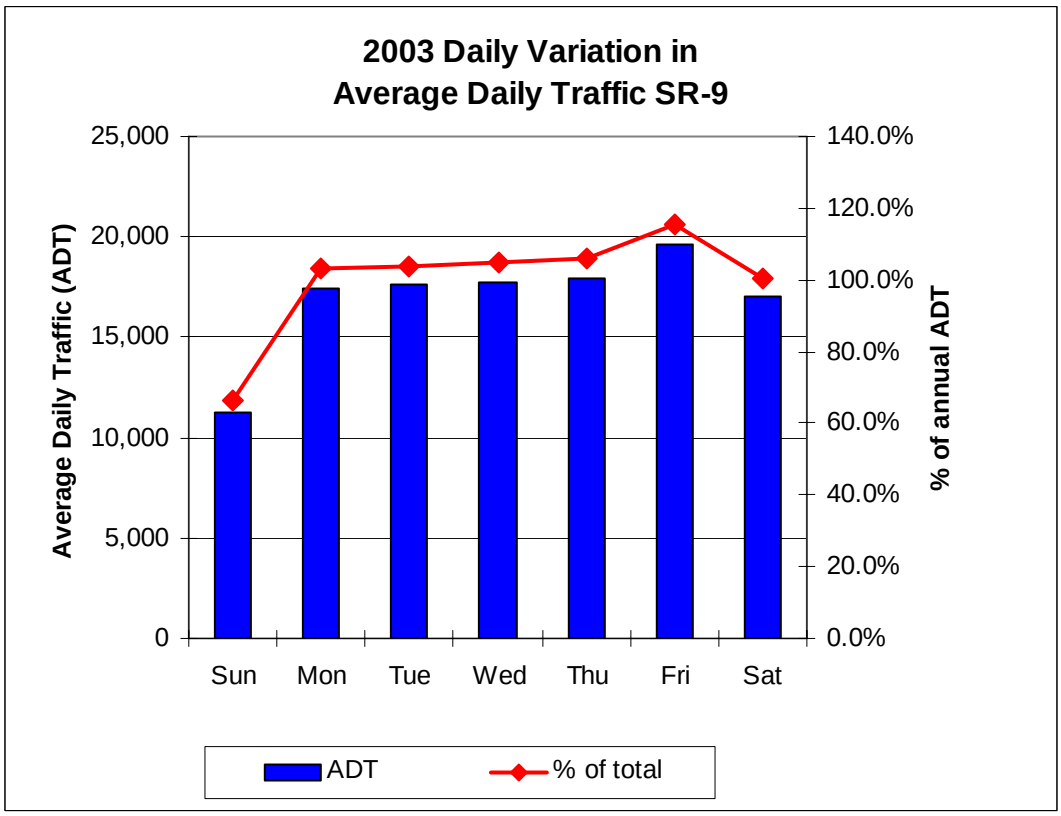
The peak month of August is consistent with a recreational usage as well as traffic traveling through the area on their way to Zion National Park**.**

The hourly traffic shows a clear average peak hour of around 3:00 TO 5:00 pm. This is consistent with an afternoon commuter peak.

A map illustrating existing and future traffic, peak season traffic, and roadway capacities is presented in the Traffic Forecast section 3.2.

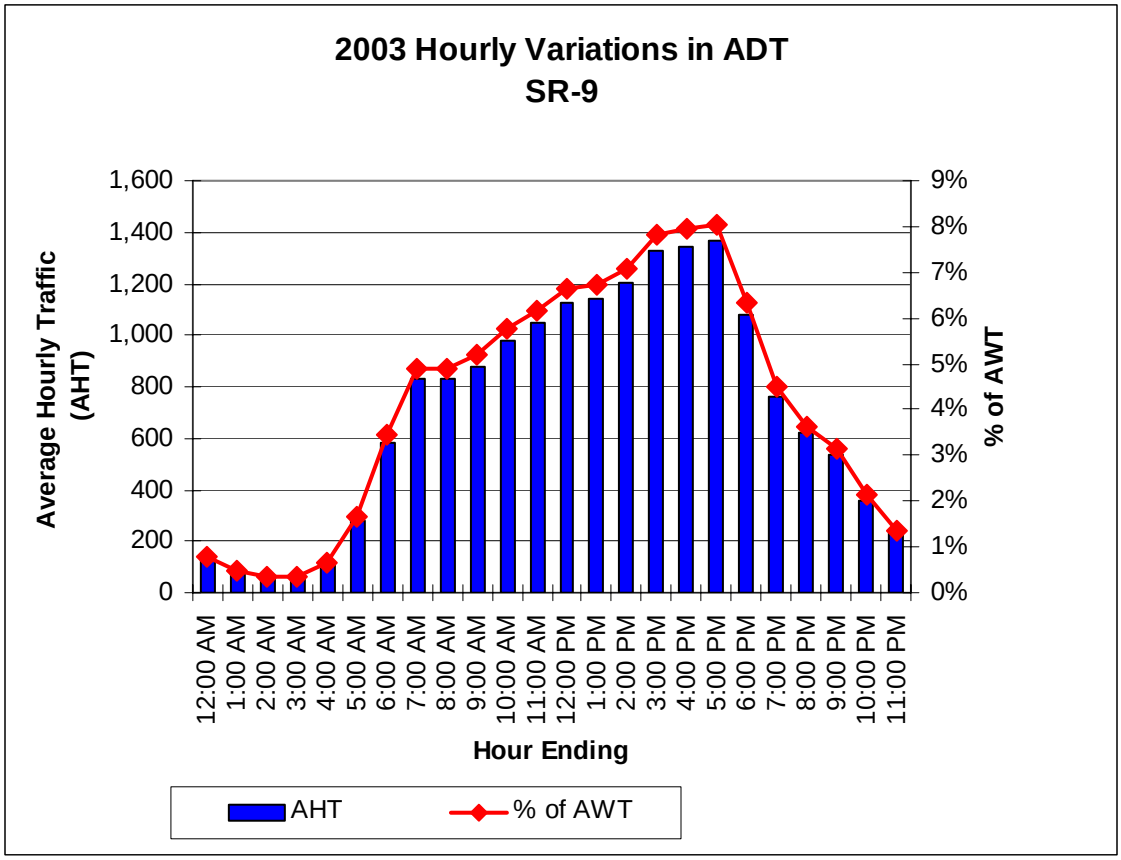
Figure 11 Monthly and Daily ADT on US-91





Source: Utah Department of Transportation

Figure 12 Hourly Variation on US-91



Source: Utah Department of Transportation

2.7 Traffic Accidents

Traffic accident data was obtained from UDOT's database of reported accidents from 2002. Table 3 summarizes the accident statistics for those segments for the year 2002. Additional information includes the average daily traffic, the number of reported accidents, and the accident rates. The roadway segment accident rates were determined in terms of accidents per million vehicle miles traveled. The crash rates for each roadway segment are compared to the expected crash rate for similar facilities across the state.

Upon review of the accident data for the state system, there appears to be a higher than expected accident rates at the following locations:

- **On SR-9 From I-15 to approx. 1 mile east of the existing freeway interchange**
- **On SR-9 (State Street downtown Hurricane) MP 9.77 to11.13**

The remainder of the state system shows a lower than expected accident rate. Figure 13 shows accident data taken from 1999-2001, which shows various segments of the state highway system and associated accident data.

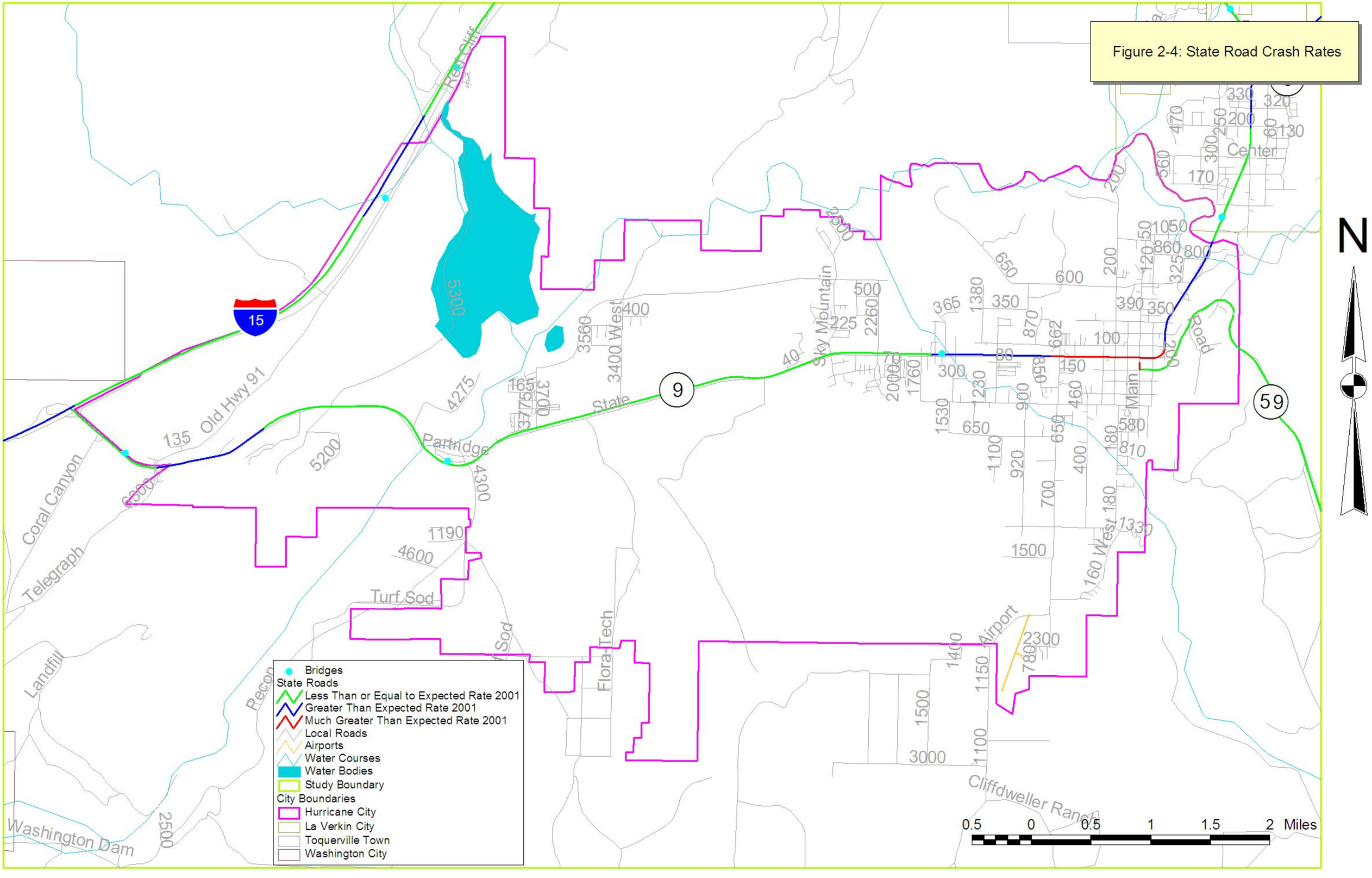
Hurricane City may wish to review the accident history for the local street system to identify any specific accident hot spot locations.

Table 3. Crash Data 2002

					Crash Rate	
Road	**From Milepost**	**End Milepost**	**ADT (2002)**	**# Crashes (2002)**	**Actual**	**Expected***
9	0	1.11	17610	15	2.33	1.85
9	1.12	9.76	16080	65	1.43	1.85
9	9.77	10.97	16910	13	1.95	1.85
9	10.98	11.13	15750	4	5.16	1.85
9	11.14	12.44	11485	8	1.56	1.85
9	12.45	13.16	4452	0	0.00	1.96
9	13.17	14.25	3835	2	1.39	1.96
15	14.5	15.95	31660	9	0.64	1.00
15	15.96	22	18165	26	0.74	1.04
17	0	0.85	3640	1	0.65	1.88
59	18	22.12	2790	6	1.50	2.28

* Statewide average accident rates for functional class and volume group.
Red indicates higher than expected rates of accidents

Figure 2-4: State Road Crash Rates



2.8 Bicycle and Pedestrian

The Federal Highway Administration recognizes the increasingly important role of bicycling and walking in creating a balanced, intermodal transportation system, and encourages state and local governments to incorporate all necessary provisions to accommodate bicycle and pedestrian traffic. Hurricane City's General Plan appears to support this endeavor by reinforcing that the City will "anticipate the future needs of alternative travel modes (such as walking, bikes and buses) in the planning and design of streets and developments". In following this directive, Hurricane is encouraged to adopt a "complete streets" philosophy that allows for the advancement of a transportation system for both motorized and non-motorized travel.

2.8.1 Biking/Trails

The City currently does not have any dedicated bike lanes and shoulder-width along the roadways can differ depending on location. Some of the newer developments consist of narrow streets with narrow shoulders, while wider shoulders can be found in the more established areas. Bicyclists in Hurricane are mostly recreational riders, however there are a number of cycling tour groups traveling through the City during the spring and summer months. The City enjoys a 4-mile unpaved multi-use trail along the canal, used by both cyclists and pedestrians. Residents also have access to a trail on the eastern side of the City, developed and made available by the Bureau of Land Management (BLM).

The General Plan identifies the need to develop connecting park facilities within the City, specifically in the area along Gould's Wash, citing the already-available desired features needed for a bicycle/pedestrian/equestrian trail network. Hurricane City also has a well-developed Master Trail Plan that documents a connected trails system throughout the area, traversing numerous parks and providing a variety of destination points.

In addition to the Hurricane Master Trail Plan, the Governor's Legacy Trails Initiative as included in the State's Long Range Plan, identifies a network of trails that when completed would ensure access to trails/paths within 15 minutes of home and work for all Utahns. One of these is the Three Rivers trail, which is an 86-mile unpaved trail with a section running along SR-9 in Hurricane City.

2.8.2 Pedestrian

Sidewalks are in place to accommodate pedestrian traffic in much of the City and are most prevalent in the downtown area. Sidewalks in this location are typically 6-feet wide in order to provide sufficient space within the business district, with other City locations consisting of the standard 4-foot wide installation. There are indications from the City that this standard may be re-evaluated and possibly increased to a 5-foot wide standard. Most sidewalks are in good condition and invite pedestrian traffic. Crosswalks at intersections are maintained at regularly scheduled intervals or on an as needed basis.

With few exceptions, the City requires developers to include sidewalk in all new developments. This requirement, in addition to a partnering approach with homeowners and property owners to install sidewalk, has allowed for an increase in areas with sidewalk throughout the City. Hurricane has also had the opportunity to participate in UDOT's Safe Sidewalk Program for installation along SR-9. This program provides funding assistance to those areas in need of new sidewalk in order to create a safer travel experience for the pedestrian.

Hurricane City's linear shape has created some difficulty in establishing connectivity between developments, resulting in some isolated subdivisions. There are also locations where sidewalks are in need of retrofitting to become ADA compliant. The City is taking steps to remedy these situations and others as funding becomes available.

2.9 Public Transportation

There is no city or regional bus transit system serving the Hurricane area. As Hurricane continues to grow, the feasibility of inclusion in the St George area transit system, known as "Sun Transit," should be investigated.

Intercity bus service is provided by Greyhound Lines via a stop in nearby St. George on one of that company's main transcontinental routes utilizing I-15 and I-70. As of this writing Greyhound provides service from St George to Los Angeles and Phoenix via Las Vegas. Greyhound also operates north to Salt Lake City as well as east to Chicago via Grand Junction and Denver.

The nearest intercity rail passenger service is provided via a stop in Salt Lake City by Amtrak's "California Zephyr" operating between Chicago and the San Francisco Bay Area. Amtrak also serves Flagstaff and Kingman, Arizona with their "Southwest Chief" passenger train en route from Chicago to Los Angeles.

Regional airline service is available at the St. George Municipal Airport with the nearest major airports being Las Vegas and Salt Lake City. Commuter air and ground shuttle van service is available from St George to both Las Vegas and Salt Lake City airports.

2.10 Freight

Hurricane is located along Interstate Highway 15, which is the main north/south highway freight route serving the Mountain West region of the United States. Much of this north/south traffic is a part of the CANAMEX Corridor, linking Canada with Mexico as a result of the North American Free Trade Agreement (NAFTA). I-15 also handles considerable east/west transcontinental truck freight traffic connecting to and from I-70 at Cove Fort, Utah, 115 miles north of Hurricane.

Hurricane is also located at the junction of State Routes 9 and 59, which are important secondary truck freight routes not only serving local industries, but handling an increasing number of long-haul trucks as well. CANAMEX and other north/south truck traffic from Phoenix, Tucson and Mexico use I-17 from Phoenix to Flagstaff, Arizona, U.S. Highway 89 from Flagstaff to Kanab, Utah via Page, Arizona, then Arizona State Highway 389/Utah State Route 59 from the Kanab/Fredonia area to Hurricane. This same routing from Flagstaff feeds east/west truck traffic into Hurricane from Interstate 40 en route west from Texas and the southeastern states.

Given its location along I-15 as well as its proximity to major markets and seaports in California, Hurricane is attracting large distribution warehouses and manufacturing plants. Eleven of Hurricane's industries/warehouses account for an average of 1200 trucks each week into the community, a number which may increase to over 1500 over the next three years alone. The future of these facilities, with their employment, payroll and tax base, is directly dependant on the ability of the trucking industry to serve them in a timely and efficient manner.

Of particular concern to these vital Hurricane businesses, as well as the trucking industry, is the State Route 9/59 corridor through Hurricane. Of primary concern is the lengthy 8% downgrade of Hurricane Hill, which passes Hurricane Elementary School and terminates at Hurricane High School. Improved truck access from I-15 to industries in both downtown Hurricane as well as at the Hurricane Industrial Park at 6300 West and S.R. 9 is also critical to the continued economic growth of the community.

Railroad freight service is not available in southwestern Utah inasmuch as the Union Pacific Railroad's Salt Lake City to Los Angeles mainline was built to the north in 1905 in order to bypass the mountainous terrain in the St George/Hurricane area. The nearest rail freight service to Hurricane is in Cedar City and Milford, Utah, and in Moapa and Las Vegas, Nevada.

Limited freight and parcel service is provided at the St George Airport with full air cargo operations available at Las Vegas and Salt Lake City.

2.11 Aviation Facilities & Operations

Located two miles south of downtown, the Hurricane Airport – also known as General Dick Stout Field – provides limited daytime-only general aviation service. About 60 private aircraft call General Dick Stout Field home, which is equipped with a single runway, #18/36, which is 40 feet wide, 3410 feet long. There is no control tower, runway or taxiway lighting, approach instrumentation, or weather aids at the Hurricane Airport. Airport services are limited to tie-downs and 100LL fuel, with OZN TVOR/DME navigational aids. Future plans call for runway reconstruction and expansion to 75 feet wide and 3900 feet in length, as well as construction of a wildlife perimeter fence. Both of these projects are scheduled for completion by 2007. The nearest full-service general aviation airport is in St. George.

2.12 Revenue

Maintenance of existing transportation facilities and construction of new facilities come primarily from revenue sources that include the Hurricane City general fund, federal funds and State Class C funds.

Financing for local transportation projects consists of a combination of federal, state, and local revenues. However, this total is not entirely available for transportation improvement projects, since annual operating and maintenance costs must be deducted from the total revenue. In addition, the City is limited in their ability to subsidize the transportation budget from general fund revenues.

2.12.1 State Class B and C Program

The distribution of Class B and C Program monies is established by state legislation and is administered by the State Department of Transportation. Revenues for the program are derived from State fuel taxes, registration fees, driver license fees, inspection fees, and transportation permits. Twenty-five percent of the funds derived from the taxes and fees are distributed to cities and counties for construction and maintenance programs.

Class B and C funds are allocated to each city and county by the following formula: 50% based on the population ratio of the local jurisdiction with the population of the State, 50% based on the ratio that the Class B roads weighted mileage within each county and the class C roads weighted mileage within each municipality bear to the total class B and Class C roads weighted mileage within the state. Weighted means the sum of the following: (i) paved roads multiplied by five; (ii) graveled road miles multiplied by two; and (iii) all other road types multiplied by one. (Utah Code 72-2-108) For more information go to UDOT's homepage @ www.udot.utah.gov, tab on "Doing Business" select the tab for "Local Government Assistance" here you will find the Regulations governing Class B&C funds

The table below identifies the ratio used to determine the amount of B and C funds allocated.

Apportionment Method of Class B and C Funds

Based on	Of
50%	Roadway Mileage *Based on Surface Type Classification (Weighted Measure) Pave Road (X 5) Graveled Road (X 2) Other Road (X 1)
50%	Total Population

Class B and C funds can be used for maintenance and construction of highways, however thirty percent of the funds must be used for construction or maintenance projects that exceed $40,000. Class B and C funds can also be used for matching federal funds or to pay the principal, interest, premiums, and reserves for issued bonds.

Hurricane City received $376,240.65 in 2003 for its Class C fund allocation.

2.12.2 Federal Funds

There are federal monies that are available to cities and counties through federal-aid program. The funds are administered by the Utah Department of Transportation. In order to be eligible, a project must be listed on the five-year Statewide Transportation Improvement Program (STIP).

The Surface Transportation Program (STP) provides funding for any road that is functionally classified as a collector street or higher. STP funds can be used for a range of projects including rehabilitation and new construction. The Joint Highway Committee programs a portion of the STP funds for projects around the State for urban areas. A portion of the STP funds can be used in any area of the State, at the discretion of the State Transportation Commission.

Transportation Enhancement funds are allocated based on a competitive application process. The Transportation Enhancement Advisory Committee reviews the applications and then a portion of those are recommended to the State Transportation Commission for funding. Transportation enhancements include 12 categories ranging from historic preservation, bicycle and pedestrian facilities to water runoff mitigation. Other funds that are available are State Trails Funds, administered by the Division of Wildlife Resources.

The amount of money available for projects specifically in the study area varies each year depending on the planned projects in UDOT's Region Four. As a result, federal aid program monies are not listed as part of the study area's transportation revenue.

2.12.3 Local Funds

Hurricane City, like most cities, has utilized general fund revenues in its transportation program. Other options available to improve the City's transportation facilities could involve some type of bonding arrangement, either through the creation of a redevelopment district or a special improvement district. These districts are organized for the purpose of funding a single, specific project that benefits and identifiable group of properties. Another source is through general obligation bonding arrangements for projects felt to be beneficial to the entire entity issuing the bonds.

2.12.4 Private Sources

Private interests often provide alternative funding for transportation improvements. Developers construct the local streets within the subdivisions and often dedicate right-of-way and participate in the construction of collector or arterial streets adjacent to their developments. Developers can be considered as an alternative source of funds for projects because of the impacts of the development, such as the need for traffic signals or street widening. Developers should be expected to mitigate certain impacts resulting from their developments. The need for improvements, such as traffic signals or street widening can be mitigated through direct construction or impact fees.

3. Future Conditions

3.1. Land Use and Growth

Hurricane City's Transportation Master Plan must be responsive to current and future needs of the area. The area's growth must be estimated and incorporated into the evaluation and analysis of future transportation needs. This is done by:

- Forecasting future population, employment, and land use;
- Projecting traffic demand;
- Forecasting roadway travel volumes;
- Evaluating transportation system impacts;
- Documenting transportation system needs; and
- Identifying improvements to meet those needs.

This chapter summarizes the population, employment, and land use projections developed for the project study area. Future traffic volumes for the major roadway segments are based on projections utilizing 20 years of traffic count history. The forecasted traffic data are then used to identify future deficiencies in the transportation system.

3.1.1 Population and Employment Forecasts

The Governor's Office of Planning and Budget develop population and employment projections. The current population and employment levels, as well as the future projections for each are shown for Hurricane City and Washington County in the following table.

Population and Employment

Year	City	County	
	Population	Population	Employment
2000	7,339	83,781	45,465
2030	19,113	218,198	118,024

3.1.2 Future Land Use

The City has an annexation plan that describes where it plans to grow. Some areas for developments were discussed during the course of the Transportation MasterPlan. Updated Land Use documents can be found in the Hurricane City General Plan.

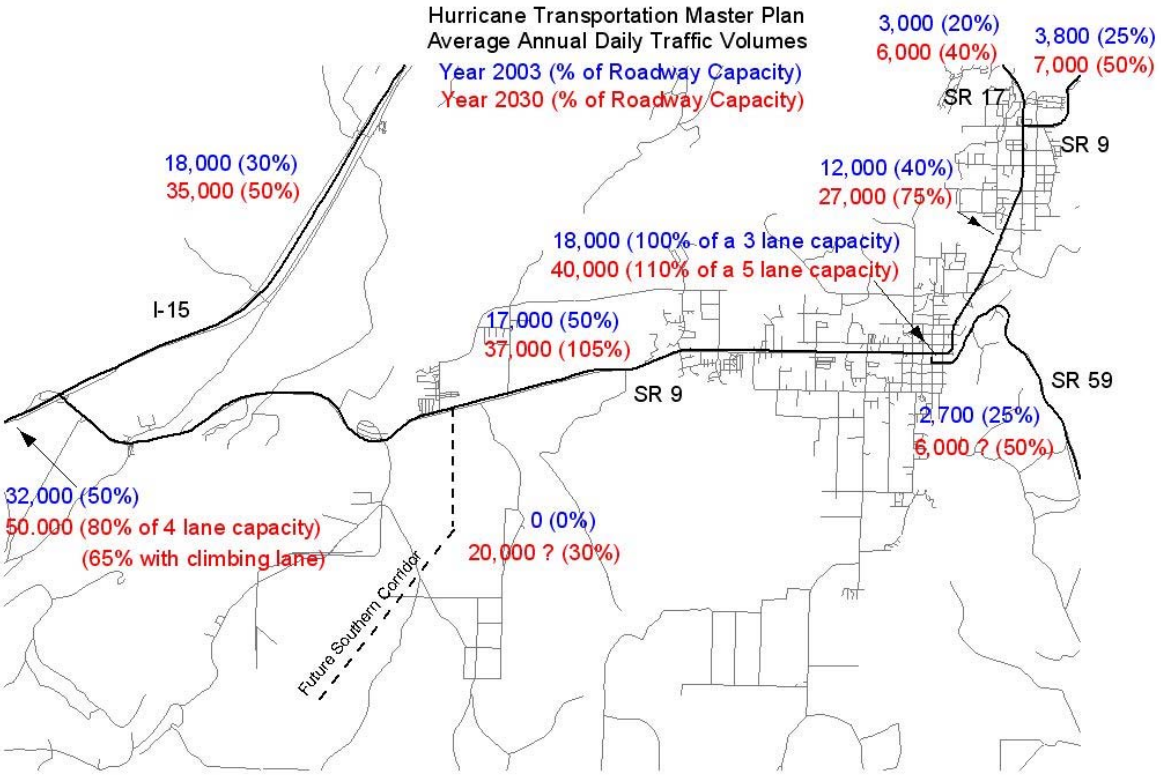
While specific development plans change with time, it is important to note possible areas of development within the Hurricane City area. Commercial and industrial growth is also important in understanding transportation needs.

3.2 Traffic Forecast

Traffic in the Hurricane area is growing and will continue to grow. Although the population projections from the Governors Office of Planning and Budget show a 3% to 4% annual growth, traffic has historically grown at about 4% to 5%. The three-lane sections of Downtown Hurricane are currently operating at their maximum capacities. If historical growth continues on the same trend, the four lane divided SR 9 highway between the future Southern Corridor and Hurricane could reach its capacity in the next 25 years.

There are two other studies that have projected future traffic volumes in this area. One is the Southern Corridor EIS and the other is a planning study for SR 9. The volumes illustrated on the following page presents average annual daily traffic for years 2003 and 2030 based on historical growth. These estimates may be marginally different from those published in the other two ongoing studies. Also shown in the following map is the percentage of the roadway capacity the traffic will reach. This assumes the following two roadway improvements planned in the next several years will be constructed:

- SR 9 (State Street) through Downtown Hurricane widened to 5 lanes
- I-15 South of SR 9 widened to include a climbing lane Northbound



4. Planning Issues and Guidelines

Provided below is a discussion of various issues with a focus on elements that promote a safe and efficient transportation system in the future.

4.1 Guidelines and Policies

These guidelines address certain areas of concern that are applicable to Hurricane City's Transportation Master Plan.

4.1.1 Access Management

This section will define and describe some of the aspects of Access Management for roadways and why it is so important. Access Management can make many of the roads in a system work better and operate more safely if properly implemented. There are many benefits to properly implemented access management. Some of the benefits follow:

- Reduction in traffic conflicts and accidents
- Reduced traffic congestion
- Preservation of traffic capacity and level of service
- Improved economic benefits businesses and service agencies
- Potential reductions in air pollution from vehicle exhausts

4.1.1.1 Definition

Access management is the process of comprehensive application of traffic engineering techniques in a manner that seeks to optimize highway system performance in terms of safety, capacity, and speed. Access Management is one tool of many that makes a traffic system work better with what is available.

4.1.1.2 Access Management Techniques

There are many techniques that can be used in access management. The most common techniques are signal spacing, street spacing, access spacing, and interchange to crossroad access spacing. There are various distances for each spacing, dependant upon the roadway type being accessed and the accessing roadway. UDOT has developed an access management program and more information can be gathered from the UDOT website and from the Access Management Program Coordinator.

4.1.1.3 Where to Use Access Management

Access Management can be used on any roadway. In some cases, such as State Highways, access management is a requirement. Access management can be used as

an inexpensive way to improve performance on a major roadway that is increasing in volume. Access management should be used on new roadways and roadways that are to be improved so as to prolong the usefulness of the roadway.

4.1.2 Context Sensitive Solutions

Context Sensitive Solutions (CSS) addresses the need, purpose, safety and service of a transportation project, as well as the protection of scenic, aesthetic, historic, environmental and other community values. CSS is an approach to transportation solutions that find, recognize and incorporate issues/factors that are part of the larger context such as the physical, social, economic, political and cultural impacts. When this approach is used in a project the project become better for all of the entities involved.

4.1.3 Recommended Roadway Cross Sections

Cross sections are the combination of the individual design elements that constitute the design of the roadway. Cross section elements include the pavement surface for driving and parking lanes, curb and gutter, sidewalks and additional buffer/landscape areas. Right-of-way is the total land area needed to provide for the cross section elements. Suggested types of cross-sections can be found in figure 4-1.

The design of the individual roadway elements depends on the intended use of the facility. Roads with higher design volumes and speeds need more travel lanes and wider right-of-way than low volume, low speed roads. The high use roadway type should include wider shoulders and medians, separate turn lanes, dedicated bicycle lanes, elimination of on street parking, and control of driveway access. For most roadways, an additional buffer area is provided beyond the curb line. This buffer area accommodates the sidewalk area, landscaping, and local utilities. Locating the utilities outside the traveled way minimizes traffic disruption in utility repairs or changes in service are needed.

Federal Highway standard widths apply on the all roads that are part of the state highway system. Also, all federally funded roadways in Hurricane City and Washington County must adhere to the same standards for widths and design.

4.2 Bicycles and Pedestrians

4.2.1 Bicycles/Trails

Bicycles are allowed on all roadways, except where legally prohibited, and as such should be a consideration on all roads that are being designed and constructed, and as roadway improvements are taking place. To increase the level of interest in bicycling in the Hurricane City area, the City should encourage developers to include separate bicycle/pedestrian pathways in all new developments. Opportunities to include bike lanes and increased shoulder width in conjunction with a roadway project should be taken whenever technically, environmentally, and financially feasible. The City is encouraged to follow the recommendations laid out in the Hurricane Trail Study and the Governor's

Legacy Trail Initiative and move forward in developing the trails system referenced in Chapter 2 of this Plan. Indication from the City is that there is some funding available to begin area trail's development.

It is important to note that regardless of the trails system's function, as the bike/trail facilities are planned, designed and constructed, the City should review the connectivity of the trails systems. With input from the community, a review of the connectivity of the trails should play an integral role in the decision making process for potential projects. In order to enhance the quality of life for those in the community, the trails should be accessible to all users and incorporate ADA requirements.

The trails, when constructed, may have slight variances in application type due to possible differences in the terrain at a specific trail location or differing user needs. However, regardless of the design type, the applicable design standards found in the latest version of the AASHTO Guide for the Development of Bicycle Facilities should be followed, as well as the Manual on Uniform Traffic Control Devices (MUTCD) guidelines for appropriate signage of the trails system.

4.2.2 Pedestrians

Every effort should be made to accommodate pedestrians throughout Hurricane City. An opportunity to include accessible sidewalks, while adhering to ADA requirements, during construction of other projects is encouraged. For the safety and convenience of pedestrian traffic, sidewalk placement should be free from debris and obstructions or impediments such as utility poles, trees, bushes, etc. The City should conduct a sidewalk inventory to document locations where there may be gaps or safety concerns in the sidewalk system. Effort should then be made to construct and complete the sidewalks where gaps or problems occur. The City will continue to require developers to include sidewalk placement or improvements in their respective project plans. The interconnectedness of the City's sidewalk system should be considered as development takes place.

Sidewalks in residential areas should be at least 5-feet wide whenever adequate right-of-way can be secured. This will provide sufficient room and a level of comfort to persons walking in pairs or passing and will specifically allow for persons with strollers or in wheelchairs to pass. On major roadways, sidewalks at least 6-feet wide and with a 6 to 10-foot park strip are desirable. In pedestrian-focused areas, such as schools, parks, sports venues or theaters, and in hotel and market districts, even wider sidewalks are recommended to accommodate and encourage a higher level of pedestrian activity, especially where tourist use would be expected. To ensure consistency of sidewalks throughout the area, UDOT's approved standard for sidewalks should be followed.

The City is encouraged to continue working with the Utah Department of Transportation's Traffic and Safety Division in participating in the Safe Sidewalks Program. Continued effort should be taken by the City to install sidewalks using this funding program. Application requirements are available by contacting UDOT's Region Four office.

The City should be aware of, and coordinate with, the area schools that are tasked with developing a routing plan to provide a safe route to school. The routing plan is to be reviewed and updated annually. Information regarding the Safe Routes to School program is available by contacting the Utah Department of Transportation's Traffic and Safety Division.

4.3 Enhancements Program

In 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA) created the Transportation Enhancement program. The program has since been reauthorized in subsequent bills (i.e. TEA-21). The Transportation Enhancement program provides opportunities to use federal dollars to enhance the cultural and environmental value of the transportation system. These transportation enhancements are defined as follows by TEA-21:

> The term 'transportation enhancement activities' means, with respect to any project or the area to be served by the project, any of the following activities if such activity relates to surface transportation: provision of facilities for pedestrians and bicycles, provision of safety and educational activities for pedestrians and bicyclists, acquisition of scenic easements and scenic or historic sites, scenic of historic highway programs (including the provision of tourist and welcome center facilities), landscaping and other scenic beautification, historic preservation, rehabilitation and operation of historic transportation buildings, structures, or facilities (including historic railroad facilities and canals), preservation of abandoned railway corridors (including the conservation and use thereof for pedestrian or bicycle trails), control and removal of outdoor advertising, archeological planning and research, environmental mitigation to address water pollution due to highway runoff or reduce vehicle caused wildlife mortality while maintaining habitat connectivity, and establishment of transportation museums.

The Utah Transportation Commission, with the help of an advisory committee, decides which projects will be programmed and placed on the Statewide Transportation Improvement Program (STIP). Applications are accepted in an annual cycle for the limited funds available to UDOT for such projects. Information and Applications for the current cycle can be found on UDOT's homepage @ www.udot.utah.gov, tab on "Doing Business" select "Planning and Programming", here you will find a sub-topic entitled "Transportation Enhancement Program". Applications must be received by the UDOT Program Development Office, on or before the specified date to be considered. Projects will compete on a statewide basis.

4.4 Transportation Corridor Preservation

Transportation Corridor Preservation will be introduced as a method of helping Hurricane's Transportation Master Plan. This section will define what Corridor Preservation is and ways to use it to help the Transportation Master Plan succeed for the City.

4.4.1 Definition

Transportation Corridor Preservation is the reserving of land for use in building roadways that will function now and can be expanded at a later date. It is a planning tool that will reduce future hardships on the public and the city. The land along the corridor is protected for building the roadway and maintaining the right-of-way for future expansion by a variety of methods, some of which will be discussed here.

4.4.2 Corridor Preservation Techniques

There are three main ways that a transportation corridor can be preserved. The three ways are acquisition, police powers, and voluntary agreements and government inducements. Under each of these are many sub-categories. The main methods will be discussed here, with a listing of some of the sub-categories.

4.4.2.1 Acquisition

One way to preserve a transportation corridor is to acquire the property outright. The property acquired can be developed or undeveloped. When the city is able to acquire undeveloped property, the city has the ability to build without greatly impacting the public. On the other hand, acquiring developed land can be very expensive and can create a negative image for the City. Acquisition of land should be the last resort in any of the cases for Transportation Corridor Preservation. The following is a list of some ways that land can be acquired.

- Development Easements
- Public Land Exchanges
- Private Land Trusts
- Advance Purchase and Eminent Domain
- Hardship Acquisition
- Purchase Options

4.4.2.2 Exercise of Police Powers

Police powers are those ordinances that are enacted by a municipality in order to control some of the aspects of the community. There are ordinances that can be helpful in preserving corridors for the Transportation Master Plan. Many of the ordinances that can be used for corridor preservation are for future developments in the community. These can be controversial, but can be initially less intrusive.

- Impact Fees and Exactions
- Setback Ordinances
- Official Maps or Maps of Reservation
- Adequate Public Facilities and Concurrency Requirements

4.4.2.3 Voluntary Agreements and Governmental Inducements

Voluntary agreements and governmental inducements rely on the good will of both the developers and the municipality. Many times it is a give and take situation where both parties could benefit in the end. The developer will likely have a better-developed area and the municipality will be able to preserve the corridor for transportation in and around the development. Listed below are some of the voluntary agreements and governmental inducements that can be used in order to preserve transportation corridors in the city limits.

- Voluntary Platting
- Transfer of Development Rights
- Tax Abatement
- Agricultural Zoning

Each of these methods has its place, but there is an order that any government should try to use. Voluntary agreements and government inducements should be used, if possible, before any police powers are used. Police powers should be tried before acquisition is sought. UDOT has developed a toolkit to aid in corridor preservation techniques. This toolkit contains references to Utah code and examples of how the techniques have been used in the past.

5. Transportation Improvement Projects

5.1 Current Statewide Transportation Improvement Program (2004-2008 STIP)

At the present time there is a project under consideration and investigation in the Hurricane City area. Currently in the STIP are the following Projects:

- Reconstruction and Road Widening of SR-9 from Hurricane to LaVerkin

Also, this project is currently listed on the State of Utah's Long Range Plan, Utah Transportation 2030:

- Reconstruction along SR-59; from MP 10.92 to MP 11.20

5.2 Recommended Projects

The following list identifies the seven projects that have been identified as having the highest priority to the Hurricane City Transportation Advisory Committee. These needs were identified through a series of meetings where the TAC identified the needs and set priorities for projects.

- 600 North, Make improvements and construct new roadway from SR-9 to 2200 W.
- 700 West, Widen and re-align roadway from 1300 S. to 3000 S.
- SR-59, Re-align roadway to intersect SR-9 at 600 N.
- SR-9, Widen roadway from 300 W. to 600 N.
- Southern Corridor, New roadway construction.
- SR-9, Evaluate the need for traffic signals at 2260 W. and 2600 W.
- 100 North, Widen and improve roadway from 300 E.

Additionally, many concerns and issues were identified which are found on the attached list.

Transportation Needs and Cost Estimates

Route	Project Description / Concept	Start Point	End Point	Length or Quantity	Estimated Cost
SR-9	Widen SR-9 (Downtown Hurricane)	300 West	600 North	8500 ft	$7,000,000
SR-59	Re-Align SR-59 at approach to SR-9	SR-9		6000 ft	$10,000,000
I-15	New Interchange at Gateway Industrial Park	MP 19			$20,000,000
So. Corr.	Southern Corridor (New Construction)	I-15	SR-9		???
I-15	Improvements to Interchange (SR-9 & I-15)	SR-9			$5,000,000
SR-9	Turn Lanes @ Arlington Pkwy. Intersection	Arlington Pkwy			$1,000,000
	State Highway Projects (Safety & Operational)				
SR-9	Speed Limit Study	700 West	I-15		$0
SR-9	Future Traffic Signals (Many Potential Locations)	2250 West	5300 West		$250,000 / each
					$0
	Local Highway Projects				
600 N	Improvements & New Road Construction	SR-9	200 West	4000 ft	$1,250,000
600 N	Improvements & New Road Construction	200 West	2260 West	2 Miles	$1,800,000
1300 S	New Road Construction	1150 West	Arlinton Pkwy	4000 ft	$800,000
2300 S	Improvements & New Road Construction	900 West	So. Corridor	2 Miles	$2,000,000
3000 S	New Road Construction	700 West	So. Corridor	3 Miles	$1,500,000
300 W	New Road Construction & New Bridge	400 South	1300 South	1 Mile	$2,500,000
700 W	New Road Construction	100 North	600 North	2500 ft	$850,000
900 S	New Road Construction	180 West	Arlinton Pkwy	2 Miles	$2,000,000
1150 W	New Road Construction	400 South	2300 South	2 Miles	$2,000,000
1150 W	New Road Construction	100 North	600 North	3000 ft	$600,000
400 S	New Road Construction	1760 West	Arlinton Pkwy	2500 ft	$500,000
2260 W	New Road Construction	400 South	3000 South	2 Miles	$2,000,000
700 W	Widen & Improve	1300 South	3000 South	2 Miles	$1,000,000
700 W	Intersection Improvements (Roundabout & New Bridge)	400 South			$2,500,000
Old 91	Pavement & New Bridge	Gateway	Harrisburg	2 Miles	$2,300,000
Main St.	Widen & Improve	600 North	975 North	1800 ft	$200,000
100 N	Widen & Improve (Curb, Gutter, & Sidewalk)	100 East	1300 West	6900 ft	$1,200,000
1530 W	New Road Construction	400 South	2300 South	2 Miles	$2,000,000
1760 W	Widen & Improve	SR-9	400 South	2000 ft	$400,000
	Pedestrian/ Bicycle Projects				
700 W	Sidewalks	SR-9	1300 South	1 Mile	$200,000
					$0
					$0
	Enhancement Projects				
SR-9	Landscaping / Beautification	6300 West	900 North		$200,000
					$0
	Alternative Travel Modes				
	OHV/ATV Usage Plan & Study				$50,000
	Transit Feasibilty Study				
	Studies				
	Update Access Management Guidelines			1	$50,000
	Update City Drainage Plan			1	$50,000
					$0
					$70,950,000

5.3 Revenue Summary

5.3.1 Federal and State Participation

Federal and State participation is important for the success of implementing these projects. UDOT needs to see the Transportation Master Plan so that they understand what the City wants to do with its transportation system. UDOT can then weigh the priorities of the city against the rest of the state. It is important for Hurricane City to promote projects that can be placed on UDOT's five-year Statewide Transportation Improvement Program (STIP) as soon as possible. The process for placing projects into the STIP and funding of these projects can be found at UDOT's homepage @ www.udot.utah.gov, tab on "Doing Business" select the tab for " Planning and Programming" here there is a subtopic entitled "Statewide Transportation Improvement Program (STIP)" that describes this program in detail. Additionally coordination with UDOT's Region Director and Planning Engineer will be practical.

5.3.2 City Participation

The City will fund the local Hurricane City projects. The local match component and partnering opportunities vary by the funding source.

5.4 Other Potential Funding

Previous sections of this chapter show significant shortfalls projected for the short-range and long-range programs. The following options may be available to help offset all or part of the anticipated shortfalls:

- Increased transportation impact fees.
- Increased general fund allocation to transportation projects.
- General obligation bonds repaid with property tax levies.
- Increased participation by developers, including cooperative programs and incentives.
- Special improvement districts (SIDs), whereby adjacent property owners are assessed portions of the project cost.
- Sales or other tax increase.
- State funding for improvements on the county roadway system.
- Increased gas tax, which would have to be approved by the State Legislature.
- Federal-aid available under one of the programs provided in the federal transportation bill (TEA-21 is the current bill; SAFETEA will likely be passed in late 2004).

Increased general fund allocation means that General Funds must be diverted from other governmental services and/or programs. General obligation bonds provide initial capital for transportation improvement projects but add to the debt service of the governmental agency. One way to avoid increased taxes needed to retire the debt is to sell bonds repaid with a portion of the municipalities' State Class monies for a certain number of years.

Participation by private developers provides a promising funding mechanism for new projects. Developers can contribute to transportation projects by constructing on-site

improvements along their site frontage and by paying development fees. Municipalities commonly require developers to dedicate right-of-way and widen streets along the site frontage. A negative side of the on-site improvements is that the streets are improved in pieces. If there are not several developers adjacent to one another at the same time, a continuous improved road is not provided. One way to overcome this problem is for the jurisdiction to construct the street and charge the developers their share when they develop their property.

Another way developers can participate is through development fees. The fees would be based on the additional improvements required to accommodate the new development and would be proportioned among each development. The expenditure of additional funds provided by the fees would be subject to the City's spending limit. However, development fees are often a controversial issue and may or may not be an appropriate method of funding projects.